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ABSTRACT

This is one of a series of 14 instructional components of a semester-long, environmental earth science course developed for undergraduate students. The course includes lectures, discussion sessions, and individualized learning carrel lessons. Presented are the study guide and script for a learning carrel lesson on processes and changes that have happened on earth over short time intervals. The slides, audio-cassette tape, and other materials necessary to this lesson are not included. (BT)

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Final Report

11 of 16 parts

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SCIENCE EDUCATION CENTER

STUDY GUIDE AND SCRIPT

SECTION III: PROCESSES THROUGH TIME

LESSON 6.9: SHORT TERM EVENTS

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EDUCATION & WELFARE
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ENVIRONMENTAL STUDIES

A Cooperative Project of The Department of Geological Sciences and the Science Education Center

The University of Texas at Austin

SE 028 782

ENVIRONMENTAL EARTH SCIENCE

"Environmental Earth Science" is a new course developed at The University of Texas at Austin by the Department of Geological Sciences and the Science Education Center. It is offered at The University of Texas at Austin as Geology 361K and has been tried out during the spring semesters of 1972, 1973, 1974, and 1975. Revisions have been made as necessary after each tryout. The project within which the course has been developed has been supported by the National Science Foundation.

The course includes lectures, discussion sessions, and individualized Learning Carrel Lessons. Extensive use has been made of multi-media technology in the presentation of the course. Learning Carrels for individualized instruction have been especially designed for this program. The lectures introduce specific topics, suggest problems or questions, and provide background information. The discussion sessions provide the student an opportunity to ask questions and clarify ideas. The discussion sessions also provide input and feedback to the instructor.

The Learning Carrel Lessons have been written by faculty and graduate students in the geological sciences and in science education. Writers and resource contributors include Dr. Robert Boyer, Dr. Rolland Bartholomew, Dr. Keith Young, Dr. Samuel Ellison, Dr. James Underwood, Dr. David Butts, Dr. Addison E. Lee, David Keller, Melanie Lewis, Wayne Schade, Ann Lee, and William McLoda. Technicians involved in production of scripts, sound, and photography were Stan Prescott, Lee West, Charles Geffen, and William McLoda. Artists were Jesus Rivas, Alice Canestaro, Aly Knox, and Javier Flores.

Each Learning Carrel Lesson consists of a set of 2 x 2 slides, an audio cassette tape, a study guide, a script, and other materials necessary to the lesson. The study guide and script are in this booklet. Students may set their own time schedule within an announced period when slides and tapes are made available.

The student should note the list of Learning Carrel Lesson topics to place in proper content the lesson in this booklet, and then read carefully the introduction, rationale, prerequisites, and lesson objectives in the study guide. The student should follow the instructions in the study guide for the entire lesson. In some instances, these instructions are also repeated on the audio cassette tape. The slides and tapes have been synchronized to automatically advance the slides appropriate to the audiotape. However, there is a tone signal given before the change of each slide so that the lesson can be used outside of the carrel if automatic facilities are not available. When the student is ready to start the lesson, the "on" switch should be pushed. If the slides and tape are operated manually, both will need to be turned "on." The first slide is always a title slide or a blank solid colored slide. If

the slides and tape are manually operated, this title or blank slide should be on view before the tape is started. For automatic operation, the slides and tapes will be set up by the Instructor or Proctor before the lesson and between each use. It is most important to start each lesson according to these instructions in order to provide synchronization of the slides and tape. Remember that slides placed in the tray to be used with a rear view screen are reversed from those to be used with a front view screen.

The student will be instructed by the study guide and/or the tape to stop at various places to carry out certain activities. Usually the audio-tape will say, "Please stop the tape now and restart only when you have finished this exercise." Therefore, the student should wait a few seconds to finish hearing the instruction after the word "Stop." However, one should not wait long enough for the tone signal or automatic change to the next slide. This signal should be heard after you restart the tape. If the lesson is moving too rapidly, the student may stop the tape and slides at any time to consult the study guide or script, but it is NOT POSSIBLE to back up and re-examine a given slide without completing the entire cycle of the lesson.

It is particularly important for the student to carry out the instructions for activities given in the study guide. In order that a record may be maintained of these activities, each student should pick up a copy of the STUDENT RESPONSE SHEET which include questions to be answered and the other activities requiring responses. These should be completed and turned in to the instructor as required for grading, feedback for the instructor, and to provide a basis for student interaction in the discussion group.

Each Learning Carrel Lesson is independent within the context of the course. Some of them provide direct information on a given topic, but in an individualized mode requiring some activities and thought on the part of the student. Others place the student in a role-playing situation where some position must be taken on provocative questions or issues. Others deal primarily with applications of environmental information. In all the lessons, the student is expected to receive basic information that is coordinated with the lectures, the small group discussions, and the readings.

ENVIRONMENTAL EARTH SCIENCE

LEARNING CARREL LESSONS

Section I: Man's Effect on Nature

Lesson 6.1: Population
Lesson 6.2: Land Use
Lesson 6.3: Urban Crisis (Field Trip)

Section II: Energy

Lesson 6.4: Energy
Lesson 6.5: Energy Resources
Lesson 6.6: Future Projections

Section III: Processes Through Time

Lesson 6.7: Geologic Time
Lesson 6.8: Long Term Events
Lesson 6.9: Short Term Events

Section IV: Natural Resources

Lesson 6.10: Minerals
Lesson 6.11: Conflicts of Interest
Lesson 6.12: Soils
Lesson 6.13: Water

Section V: Oceanography

Lesson 6.14: Ocean Resources
Lesson 6.15: Pollution of the Oceans

STUDY GUIDE FOR LEARNING CARREL LESSON

6.9

SHORT TERM EVENTS

ENVIRONMENTAL STUDIES

A Cooperative Project of the Department of Geological Sciences and the Science Education Center.

THE UNIVERSITY OF TEXAS AT AUSTIN

TO THE STUDENT:

This booklet contains two sections: (1) the Student Study Guide for this lesson, and (2) the Script or printed copy of the discussion recorded on the audio cassette tape.

You are expected to begin with the printed instructions in the Study Guide and follow them continuously as you study the lesson. In many instances the same or similar instructions may also be heard on the audio cassette tape. Refer to the script only if you need to refresh your memory as to something that was said. The script is provided because you cannot back up the tape if you need to review something already said on the tape.

Specific instructions will be given in the Study Guide as to when to start and stop the tape. Do not restart the tape until instructed to do so in the Study Guide.

Questions requiring written answers should be completed on the STUDENT RESPONSE SHEETS provided by the Instructor.

INSTRUCTIONS:

1. Start the audio cassette tape and slides. (For manually operated slide carousels, be sure the slide on the screen is the title slide or the blank colored slide in slot number one. Otherwise, the slides and tape will not be synchronized.) Listen to the tape and view the slides until the slide instructs you to read page 1 in the Study Guide. Then STOP THE TAPE AND SLIDES.

2. Read the Introduction, Rationale and Objectives for this lesson.

INTRODUCTION:

This program is a pictorial record of your lifetime. Perhaps we should title it "The Last Twenty-Five Years." Naturally, you know what has happened in your lifetime because you've been living all that time, but do you know what's been happening?

You have heard it said, "One picture is worth 10,000 words." Whether or not you believe this statement depends upon your imagination. The author of that statement, whoever he was, tried to convey that if you view a picture your experience-base plus your imagination will convey 10,000 words of information about that picture.

In this program we are going to test that statement. You'll see several slides that are imagination "increasers." Study them carefully and let your imagination create a story about each one. Don't feel defeated if your imagination can't supply 10,000 words for each slide. We know your experience-base is incomplete, but it's increasing rapidly.

We hope you enjoy this story of events in your lifetime. You may be surprised at the short term events that have happened during the time you've been living.

RATIONALE:

Environmental changes have increased rapidly in the past twenty to twenty-five years. To describe these changes we need to select a time scale that is appropriate. In other words, if the rate of change is high, the time scale must be short. In order to illustrate this, the program focuses on short term events -- events that have happened in the last twenty to twenty-five years.

OBJECTIVES OF THIS LESSON:

After completing this program you should be able to:

1. identify ten environmental changes that have happened in your lifetime

2. match correctly four slides of environmental events with four of the five major trends of man's recent impact on the environment

3. match correctly five slides of environmental events with five common features of man's alteration of his environment

4. cite three different examples of environmental events that support three matching statements of man's alteration of his environment

5. list ten events that illustrate the fact that geological phenomena occur as short term events simultaneously with man's interaction with his environment

INSTRUCTIONS:

3. Restart the audio cassette tape. Listen to the tape and view the slides until a black slide appears. Then view the next five slides and identify the events illustrated.

4. Continue to view the slides until the title slide, "Short Term Events," appears and you are told to turn to page 3 in the Study Guide. While viewing the slides of cards from the Center for Short Lived Phenomena of the Smithsonian Institute you may want to study copies of the cards illustrated in the Study Guide. These cards are reproduced on the next three pages.

EVENT	60-72	ALBERTA FIREBALL	11 AUGUST 1972	1424.

An exceptionally bright fireball was observed over a very large area of the United States and southern Canada on 10 August 1972. The event occurred at 1425 mountain daylight time (2025 GMT).

It was observed all the way from Las Vegas, Nevada, to Edmonton, Alberta, a distance of approximately 1200 miles. The object traveled from south to north, and was predominately reported to be blue-green in color, although others reported it to be orange or red.

There were reports of sonic phenomena from Missoula, Polson, Kalispell, and Whitefish, Montana, which were heard one to three minutes after the sighting. This was followed by an "earthquake-like" rumble. Most observers reported that the fireball was visible for several seconds and the smoke trail for up to two minutes.

The object was not fragmenting too severly--only tiny amounts. It seems to have followed the 114°W. Meridian during its entire trajectory.

The United States Air Force flew an air-sampling flight to collect fireball ablation products on Friday, 11 August 1972. The flight path was just above the tropopause. The collection filters were sent to NASA Ames Research Center, Moffet Field, California.

EVENT NOTIFICATION REPORT	
TYPE OF EVENT	ASTROPHYSICAL
DATE OF OCCURRENCE	10 AUGUST 1972
LOCATION OF EVENT	WESTERN UNITED STATES - SOUTHWESTERN CANADA
REPORTING SOURCE	NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
SOURCE CONTACT	MR. CARL POSEY
ENVIRONMENTAL RESEARCH LABORATORIES	N.O.A.A., BOULDER COLORADO, 80302 USA

This report is based on the facilities received from the Center's correspondents and is disseminated for information purposes only. The Smithsonian Institution makes no responsibility for its accuracy.

SMITHSONIAN INSTITUTION
CENTER FOR SHORT LIVED PHENOMENA
60 Garden Street
CAMBRIDGE, MASSACHUSETTS 02138
UNITED STATES OF AMERICA
CABLE SATELLITES NEW YORK
TELEPHONE (617)-864-7100

EVENT	57-72	KARTHALA VOLCANIC ERUPTION	21 SEPTEMBER 1972	1438.

The following cable from Dr. Tazieff was received on 21 September 1972:

"KARTHALA VOLCANO ON GREAT COMORO ISLAND IN THE COMORO ISLANDS STARTED NEW ERUPTION 8 SEPTEMBER 1972. RAPIDLY BUILT UP CINDER CONE AT NORTHERN END CALDERA CLOSE TO PORTE D'ITSANDRA. STILL QUITE ACTIVE WITH BOILING LAVA LAKE. EARLY FLOWS EMITTED ABOUT 2300 METERS ABOVE SEA LEVEL RAPIDLY REACHED ALTITUDE 1500 METERS AND STOPPED. FURTHER YET NARROWER FLOWS PRESENTLY RUNNING OVER EARLY ONES. NO IMMEDIATE DANGER FORESEEABLE FOR EITHER CAPITAL CITY OF MORONI OR AIRFIELDS."

Editor's Note: Karthala is a lava volcano on Great Comoro (Grande Comore) Island at Latitude 11°45'S., Longitude 41°03'E. The islands are in the northern entrance of the Mozambique Channel. July 1965 dates the last eruption of the volcano which was a basalt flow inside the caldera.

EVENT NOTIFICATION REPORT	
TYPE OF EVENT	GEOPHYSICAL
DATE OF OCCURRENCE	8 SEPTEMBER 1972 AND CONTINUING
LOCATION OF EVENT	GREAT COMORO IS. COMORO ISLANDS, INDIAN OCEAN
REPORTING SOURCE	C.N.R.S., Paris France
SOURCE CONTACT	DR. HARCUN TAZIEFF
	HEAD, VOLCANOLOGICAL RESEARCH PROGRAMS, C.N.R.S.
	15 QUAI DE BOURBON, PARIS IV, FRANCE

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EVENT	60-72	SAKURAZIMA VOLCANIC ERUPTION	26 SEPTEMBER 1972	1448.

Minamidake (South Peak) summit crater of this volcano exploded as follows:

Date	JST	Height of Volcanic smoke(m)	
August 17	00 50	1000	Much smoke and ash fall.
Septem.13	18 20	3000	Much smoke and ash fall. Volcanic thunder in rising smoke. Vegetable fields were damaged rather heavily by the ash fall.
14	22 44	-	Unknown (night-time),
15	11 08	3100	Much smoke. Cinders fell on the middle flank. Medium ash fall. One air-shock was felt.
15	17 45	4000	Much smoke and ash fall.

Active emissions of volcanic smoke with ash falls continued during the 16th of September.

Explosions which occurred on the 13th and the 15th of September were some of the most remarkable ones in recent years. Many micro-volcanic earthquakes were registered, especially from 06h A.M. on the 14th of September on three seismographs installed around this volcano, (e.g. 320 shocks from 09h to 14h and 60 shocks from 21 h to 23h on the 14th). From interpretation of previous activities, elevation of the lava mass in the summit crater is experimentally expected.

EVENT NOTIFICATION REPORT

TYPE OF EVENT	GEOPHYSICAL
DATE OF OCCURRENCE	AUG-SEPT. 1972
LOCATION OF EVENT	SOUTHERN PART OF THE ISLAND OF KYUSYU, JAPAN
REPORTING SOURCE	SEISMOLOGICAL DIV. JAPAN METEOROLOGICAL AGENCY, JAPAN
SOURCE CONTACT	SEISMOLOGICAL DIV. JAPAN METEOROLOGICAL AGENCY 4-3-1 OTEMACHI CHIYODA-KU, TOKYO, JAPAN.

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tao - sip - 5

EVENT	62-72	BAD SCHANDAU EARTHFLOW	27 SEPTEMBER 1972	1450.

"After a heavy rainfall and hailstorm, the main international railway line between Berlin-Prague was affected by an earthflow on the segment between Bad Schandau and Krippen, near Dresden. The railroad line runs below a steep slope of the Elbe River valley composed of Cretaceous sandstones. Erosion activity of an insignificant brook has cut a large bed into a slope. The waterflush took along waste material of an old stone quarry lying on the slope. Sandy, loamy weathering products together with the sandstone fragments from the waste dump ran into the valley in the form of an earthflow and buried a 50m long segment of the railroad line under a 4m thick accumulation.

The railway traffic was interrupted for a day.

EVENT NOTIFICATION REPORT

TYPE OF EVENT	GEOPHYSICAL
DATE OF OCCURRENCE	10 SEPTEMBER 1972
LOCATION OF EVENT	DRESDEN, GERMAN DEMOCRATIC REPUBLIC
REPORTING SOURCE	CZECHOSLOVAK ACADEMY OF SCIENCES
SOURCE CONTACT	ING. JAROSLAV PAŠEK, CSc. CHAIRMAN OF THE WORKING GROUP "LANDSLIDES" OF THE I.A.E.G. CZECHOSLOVAK ACADEMY OF SCIENCES GEOLOGICAL INST., PRAGUE 4, CZECH.

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tao - sip - 5

EVENT	78-72	BIG SUR MUDSLIDES	20 NOVEMBER 1972	1490.

Heavy rains on 15 November caused mud and rocks to slide from a mountain in Big Sur that had been burned bare by a fire in August. The mudslide devasted the center of the community. Houses and shops were buried beneath mud, while a single wall of the post office was left standing. Rocks several feet in diameter and large chunks of mud were released by the heavy rains.

(This is the fall rainy season. Mudslides also occurred in mid-October, when an estimated 12,000 tons of debris washed into Big Sur and the coastal highway).

The 90-foot wide Big Sur River temporarily stopped flowing as the rocks and mud blocked it. Highway I was blocked in several spots over a distance of seven miles by mud to depths of six feet. The highway was re-opened on 19 November. The slides occurred at a time when the village was almost deserted, thus preventing widespread injuries to the population. Big Sur is located at latitude 36.25°N,Long. 121.80°W.

EVENT NOTIFICATION REPORT	
TYPE OF EVENT	GEOPHYSICAL
DATE OF OCCURRENCE	OCT-NOVEMBER 1972
LOCATION OF EVENT	BIG SUR, CALIFORNIA, U.S.A.
REPORTING SOURCE	BIG SUR STATE PARK, CALIFORNIA
SOURCE CONTACT	MR.ROBERT ALLEN, CHIEF RANGER, BIG SUR STATE PARK, BIG SUR, CALIFORNIA, U.S.A.

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SSN-SLP-5

EVENT	79-72	MICHIGAN-OHIO SHORELINE FLOODING	20 NOVEMBER 1972	1491.

The most severe shoreline flooding in at least ten years caused widespread property damage to the eastern Michigan and northern Ohio shore areas.

The flooding extended from East Tawas, Michigan, to Sandusky, Ohio. The cause was a large low-pressure area that brought steady 40 MPH winds from the east-northeast that forced the water into the very flat coastal areas. There was very little precipitation associated with the storm in this area. Especially hard hit areas were the west shores of Lake St. Clair, the Detroit River (actually a strait), and extreme southeastern Michigan. The strongest winds occurred between 6:20-7:00 A.M.

Waters did not advance far inland, and thus the damage was almost exclusively restricted to the immediate shore areas.

In Ohio, the Port Clinton-Sandusky area was the hardest hit with Toledo also suffering damage. When the winds shifted to northerly, some flooding occurred in Cleveland.

EVENT NOTIFICATION REPORT	
TYPE OF EVENT	GEOPHYSICAL
DATE OF OCCURRENCE	14 NOVEMBER 1972
LOCATION OF EVENT	MICHIGAN AND OHIO SHORELINE, U.S.A.
REPORTING SOURCE	1) DETROIT FIELD OFFICE, U. S. ARMY CORPS OF ENGINEERS, DETROIT, MICHIGAN. 2) NINTH COAST GUARD DIST.
SOURCE CONTACT	1) DETROIT FIELD OFFICE, U.S. ARMY CORPS OF ENGINEERS, DETROIT, MICHIGAN. 2) NINTH COAST GUARD DIST. 1240 E.9TH ST., CLEVELAND, OHIO 44199, U.S.A.

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SSN-SLP-5

When the title slide, "Short Term Events," appears, STOP THE TAPE AND SLIDES even though the tape does not instruct you to do so. Answer the following question on your STUDENT RESPONSE SHEET.

Question 1

Identify ten environmental changes that have happened in your lifetime (short term events).

Listed below are five major trends in man's recent impact on his environment. Keep these in mind as you view the next slide.

RECENT TRENDS OF MAN'S IMPACT ON HIS ENVIRONMENT

1. Increasing variety of environmental impacts
2. Intensification of environmental impacts
3. Geographical spreading of environmental impacts
4. Increasing complexity and repercussions of environmental impacts
5. Increasing per capita environmental impacts

INSTRUCTIONS:

5. Restart the audio cassette tape. Listen to the tape and view the slide. STOP THE TAPE but continue to view the slide.

Question 2

Using the following symbols for the four photographs shown on the slide, upper left (UL), upper right (UR), lower left (LL), and lower right (LR), match the photographs with four of the trends listed above. Write the symbols in the spaces provided on your STUDENT RESPONSE SHEET.

Listed below are eight common features of man's alteration of his environment:

1. Cities are modes of greatest environmental impact
2. Many environmental changes are irreversible or persist for very long periods
3. Man is simplifying and homogenizing the landscape
4. Some organisms have greater power than man to adapt by evolution to environmental changes

5. Man's unique ability to adapt culturally to new environmental conditions, although great, may not be sufficient to compensate for new environmental demands on him as an organism

6. War is an important influence on environment

7. Political control has been required to develop and maintain major environmental modifications

8. The same few basic causes of environmental degradation underlie a wide spectrum of impacts
   - Ignorance
   - Attitude
   - Population growth
   - Technological development
   - Economics
   - Synergism

Keep these features in mind as you view the next set of slides.

INSTRUCTIONS:

6. Restart the audio cassette tape. Listen to the tape and view the next five slides. The fifth one in the set is a cartoon about the U.S. public's short lived enthusiasm for pollution clean-up. There is a pause after the fifth question: Which statement is supported best by this photograph? At this point STOP THE TAPE AND SLIDES even though you are not instructed to do so by the tape.

Question 3

Match the slide titles with the statements above in the spaces provided on your STUDENT RESPONSE SHEET.

Question 4

List five events that illustrate the fact that geological phenomena occurs as short term events simultaneously with man's interaction with his environment.

INSTRUCTIONS:

7. Restart the audio cassette tape. Listen to the tape and view the slides until the program is completed, then STOP THE TAPE AND SLIDES.

8. Complete the following assignment. Check with the Instructor or Proctor as to when and where you are to turn it in.

ASSIGNMENT:

You have finished the three programs on Processes Through Time. We would like you to reflect about these programs. To help you do this, you are to write a statement on the following topic: "What relevance does time have to the understanding of environmental problems?" The length of the statement should be longer than one page.

ANSWERS TO QUESTIONS IN STUDY GUIDE

QUESTION 1 Answers

Identify ten environmental changes that have happened in your lifetime (short term events).

There are, of course, many more than ten such events. Some possible answers are as follows:

1. Air pollution from industry and automobiles
2. Water pollution from industry
3. Problems due to population increases
4. Drug abuse problems
5. Dust bowl problems
6. Sewage disposal problems
7. Excessive use of fertilizers
8. Use of insecticides and pesticides
9. Chemical additives in food
10. Mercury contamination
11. Lead in paint and air from gasoline use
12. Asbestos problem
13. Strip mining destruction of the environment
14. Waste disposal problems
15. Excessive use of fossil fuels

QUESTION 2 Answers

RECENT TRENDS OF MAN'S IMPACT ON HIS ENVIRONMENT

LR 1. Increasing variety of environmental impacts

UR 2. Intensification of environmental impacts

LL 3. Geographical spreading of environmental impacts

UL 4. Increasing complexity and repercussions of environmental impacts

____ 5. Increasing per capita environmental impacts

QUESTION 3 Answers

The five slide titles are as follows:

A. City smog scene
B. Bio-man must re-become eco-man
C. A group of wildlife restoration stamps
D. Headline for the 35th Annual Meeting of the National Wildlife Federation
E. Cartoon about the U.S. public's short lived enthusiasm for pollution clean-up

The match of illustrations with the eight common features of man's alteration of his environment is as follows:

A 1. Cities are modes of greatest environmental impact

2. Many environmental changes are irreversible or persist for very long periods

C 3. Man is simplifying and homogenizing the landscape

4. Some organisms have greater power than man to adapt by evolution to environmental changes

B 5. Man's unique ability to adapt culturally to new environmental conditions, although great, may not be sufficient to compensate for new environmental demands on him as an organism

6. War is an important influence on environment

D 7. Political control has been required to develop and maintain major environmental modifications

E 8. The same few basic causes of environmental degradation underlie a wide spectrum of impacts

Ignorance
Attitude
Population growth
Technological development
Economics
Synergism

QUESTION 4 Answers

List five events that illustrate the fact that geological phenomena occurs as short term events simultaneously with man's interaction with his environment.

Possible answers might include:

1. Floods
2. Earthquakes
3. Landslides
4. Mass wasting of hillsides
5. Stream channel migration
6. Erosion of soils
7. Weathering
8. Freeze-Thaw cycle
9. Sand dune migration
10. Soil degradation

SCRIPT FOR LEARNING CARREL LESSON

6.9

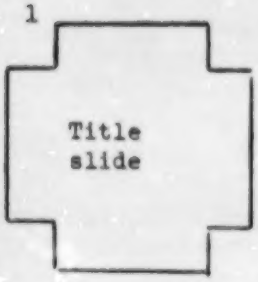
SHORT TERM EVENTS

ENVIRONMENTAL STUDIES

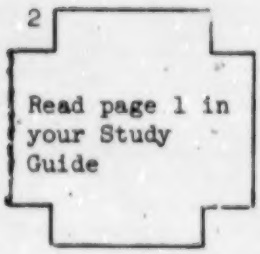
A Cooperative Project of the Department of Geological Sciences and the Science Education Center.

THE UNIVERSITY OF TEXAS AT AUSTIN

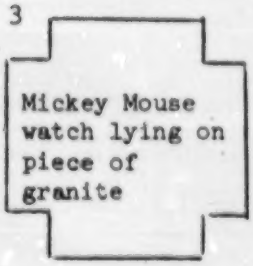
1



2

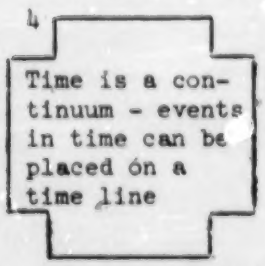


3



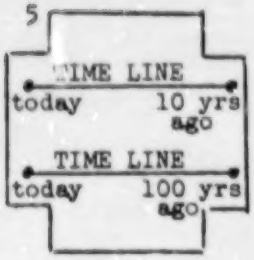
Imagine if you can the method your teachers used to introduce you to the concept of time.

4



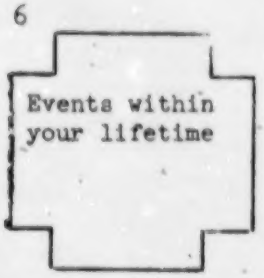
If my guess is correct, most of you remember that the teacher used a clock which is a special kind of time line. The basic premises he set down are found on the next slide.

5

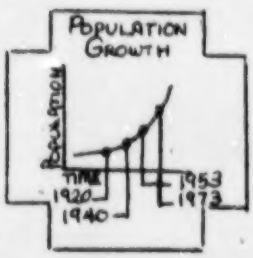


If your teacher did a good job with the time line, you found that different time lines had to be used for different series of events. Detailed events on the ten year time line seem to get lost when plotted on the one-hundred year time line.

6

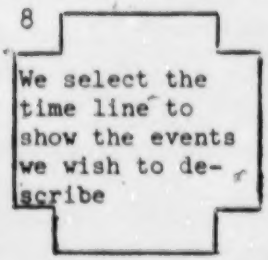


In this program, we are going to look at short term events. We arbitrarily define a short term event as something that has taken place in your lifetime, the last 20-25 years.



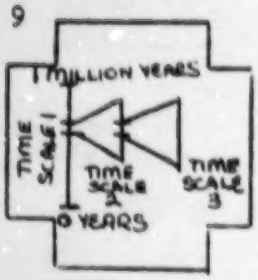
To set the perspective, look at the population curve. The vertical lines represent intervals of twenty years. Notice the slope of the curve between 1953 and 1973, your lifetime, and between 1920 and 1940, the first twenty years of your parents' lifetime. No wonder your parents were not aware of a population problem. Population increases seemed gradual during their lives.

8



The situation is analogous to a point made earlier. Each series of events requires its own special time line. Selecting a different time line is the same thing as using a different time scale.

9



This diagrammatic sketch shows that selecting a time scale can serve to enlarge or magnify an instant on a longer time scale. This is what we'll try to do in this program. We'll use a time scale that fits your lifetime, the last twenty years. Let's look at some short term events.

10

Black & white aerial photo of L.A. sub-division

The growth of Los Angeles outward from the center of town, upper right-hand corner, is a short term event. It took place within your lifetime.

11

Cartoon of houses jumbled together

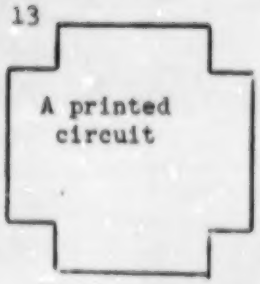
The jumble of houses signifies a short term event. Think of the new apartment houses you see being built.

---

12 Text about man's flight from urban sprawl

(Pause) Urban blight, in the sense that it's used here, is a short term event,

13



so are transistors and printed circuits.

14

It's not so funny. Who likes to eat DDT?

15

The next slides will be shown without narration.
See if you can identify the short term events.

16

17

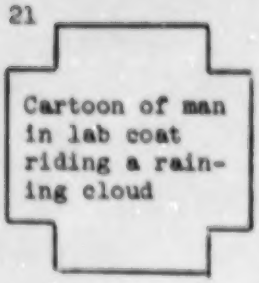
18

19

20

I'm sure you guessed the event portrayed by the slides -- space photography and space travel.

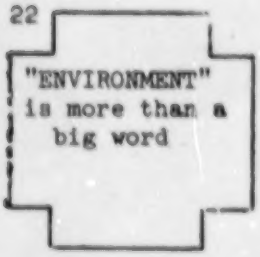
21



Twenty years ago weather modification was not a dinner table topic --

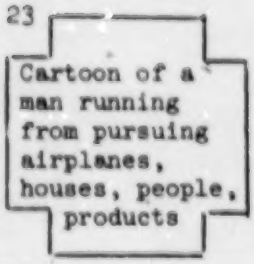
---

22

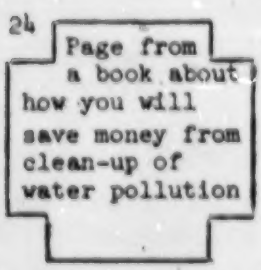


neither was environment. Much of the environmental problems appear as short term events. Think about this during the next few slides.

23



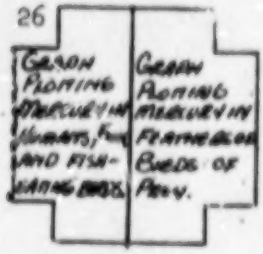
24



25

Graph plotting lead levels in glaciers, moss, and elm trees

26



27

Graph of arsenic in tobacco, fish, and shellfish

28

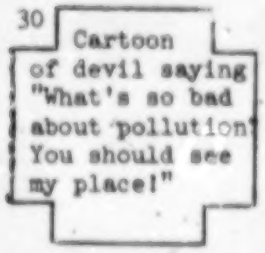
Cartoon about garbage encountered by swimmers in the channel

A new element, e -ironmental humor, has been added to your life experiences, another short term event.

29

This picture is a reminder. It illustrates that all around us are new sights when we are looking for short term events. When did this stream become polluted?

30



Even the devil has his problems.

31

This is a short term event. It happens once a year. Not all short term events need to be negative or create environmental problems.

32

Logging practices have improved, but the cutting of the trees you see here happened quickly.

33

Strip mining photograph

Strip mining has been occurring for many years. However, the pile of rubble you see here is a short term event.

34

Cartoon about bystander advising potential suicide victim that the river he's about to jump in is polluted

This is a joke?

35

Pictogram of number of passenger cars registered in U.S.

Look at what's happened to the number of cars registered in the United States. About 51 million more cars will be registered in 1975 than in 1950. What a change! Think of the energy and mineral resources this number of cars requires.

36

Photo of N.Y. city on a foggy day

Smog can be considered a short term event. New York didn't look like this in 1950.

37

Cartoon of disgruntled spaceman saying: "Take me to Ralph Nader"

Ralph Nader and all his work fits into our scheme.

38

SNOWMOBILES: Love 'em or hate 'em

This one speaks for itself.

39

Photo of Long Beach with superimposed subsidence contours

Subsidence problems in Long Beach have increased in the last 20 years. The lines connect places of equal subsidence, 27 feet maximum in the center.

40

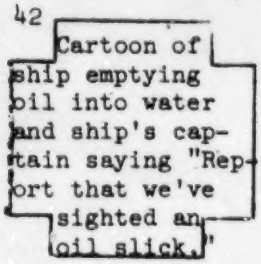
Nuclear Power Plants Boon or Blight?

Here is a recent event - we'll see more of this.

41

This pool table illustrates the fusion process. Fusion will create new short term events in the next 20 years.

42



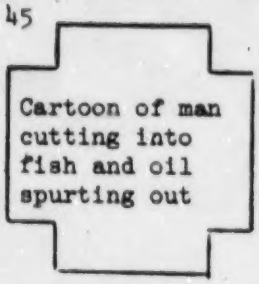
What person 20 years ago could have prophesied that oil slicks would be such a problem?

Consider the next 3 slides.

43

44

45

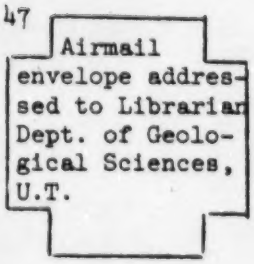


46

Let's take a music break before we see the rest of the program.

(About 30 seconds of music)

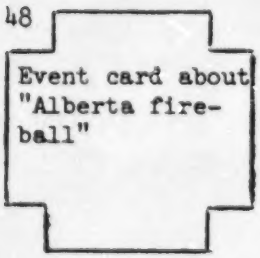
47



Recently, 1968, the Smithsonian Institution established a Center for Short-Lived Phenomena. The Center reports such phenomena by sending out cards to subscribers. Here is a photograph of the envelope in which the cards are sent. (Pause)

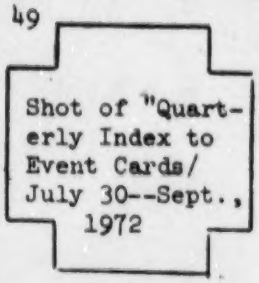
The cards look like this.

48



Notice that the source to contact is listed so that interested persons can call or contact this person for more information. You'll have a chance to see this card later on the table near the carrels. Periodically, index cards are mailed, listing the events reported quarterly.

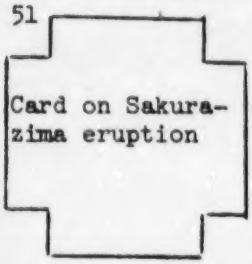
49



Here is an index card. Events 1438, 1448, and 1450 will be seen on the next three slides. This report gives the details on a volcanic eruption.

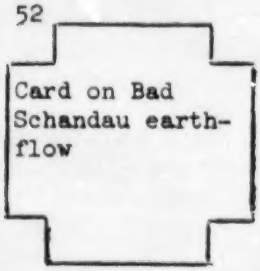
50

51



Another volcanic eruption 5 days later.

52



Events are reported from all over the world. This one happened in Czechoslovakia.

53

Card on Big Sur mud-slides

Some of you will remember this event from reading about it in the newspapers.

54

Card on Michigan-Ohio shoreline floods

Another event happened last fall.

Additional cards for you to look over are found on the reference table near the carrels.

55

Short Term Events
L.C.L. 6.9

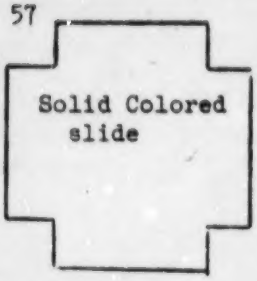
In this program you have been bombarded with a potpourri of visual impressions. We have depended upon your imagination to fill in many of the details. Now let's try to summarize some of the major ideas. Turn to page 3 in the Study Guide.

56

4 photographs of short term events

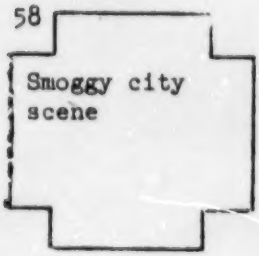
Here are 4 photographs of short term events. Match the photographs with the 5 major trends of man's recent impacts on his environment, found on page 3 in the Study Guide.

57



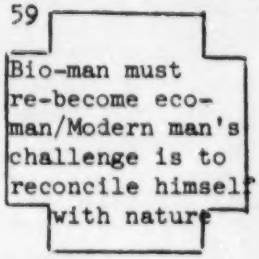
In the Study Guide is a list of 8 common features of man's alteration of his environment. The next set of 5 slides are to be used as a matching question. Which slide matches each statement? Which statement is supported best by this photograph?

58



Which statement is best supported by this photograph?

59



Which statement is supported best by this photograph?

60

Which statement is supported best by this photograph?

61 Headline and newsprint from 35th Annual Meeting of National Wildlife Federation

Which statement is best supported by this photograph?

---

62 Cartoon about U.S. public's short-lived enthusiasm for pollution clean-up

Which statement is supported best by this photograph?

There are several morals in this program. However, one moral that stands out above all others is seen on the next slide.

---

63 Butterfly lying on child's face

---

64 Cartoon about 2 lions hesitating to eat 2 "almost extinct" human beings

The time to act requires that we start with today's short term events.

---

65 The End of this Lesson

LESSON 6.9: SHORT TERM EVENTS

STUDENT RESPONSE SHEETS

Name _____

Date _____

LESSON 6.9: SHORT TERM EVENTS

STUDENT RESPONSE SHEET

Question 1: Identify ten environmental changes that have happened in your lifetime (short term events).

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Question 2: Using the following symbols for the four photographs shown on the slide, upper left (UL), upper right (UR), lower left (LL), and lower right (LR), match the photographs with four of the trends listed below. Titles of the photographs are as follows:

UL -- Graph of wastes injected into earthquake zone
UR -- Urban blight poster
LL -- Money saved from water pollution clean-up
LR -- Graph of heavy metal concentrations in moss and trees

RECENT TRENDS OF MAN'S IMPACT ON HIS ENVIRONMENT

_____ 1. Increasing variety of environmental impact

_____ 2. Intensification of environmental impact

_____ 3. Geographical spreading of environmental impact

_____ 4. Increasing complexity and repercussions of environmental impacts

_____ 5. Increasing per capita environmental impacts

Name _____

Date _____

LESSON 6.9: SHORT TERM EVENTS

STUDENT RESPONSE SHEET

Question 3: Match the letter of the five slide titles listed below with five of the eight common features of man's alteration of his environment.

A. City smog scene
B. Bio-man must re-become eco-man
C. A group of wildlife restoration stamps
D. Headline for the 35th Annual Meeting of the National Wildlife Federation
E. Cartoon about the U.S. public's short lived enthusiasm for pollution clean-up

_____ 1. Cities are modes of greatest environmental impact

_____ 2. Many environmental changes are irreversible or persist for very long periods

_____ 3. Man is simplifying and homogenizing the landscape

_____ 4. Some organisms have greater power than man to adapt by evolution to environmental changes

_____ 5. Man's unique ability to adapt culturally to new environmental conditions, although great, may not be sufficient to compensate for new environmental demands on him as an organism

_____ 6. War is an important influence on environment

_____ 7. Political control has been required to develop and maintain major environmental modifications

_____ 8. The same few basic causes of environmental degradation underlie a wide spectrum of impacts

Ignorance
Attitude
Population growth
Technological development
Economics
Synergism

Name _____

Date _____

LESSON 6.9: SHORT TERM EVENTS

STUDENT RESPONSE SHEET

Question 4: List five events that illustrate the fact that geological phenomena occurs as short term events simultaneously with man's interaction with his environment.

1.

2.

3.

4.

5.